ETHICAL ASPECTS REGARDING ACUTE INTOXICATION IN CHILDREN

Alina Costina Luca*, Constantin Iordache*

Abstract
The increase of frequency of intoxications in children in recent decades is determined by the industrialization degree, the technical progress, and to the increase of life standards. Therefore, intoxications were included among the civilization specific diseases, having important medical-social and bioethical repercussions, requiring expensive and long-term care and producing much human suffering which can sometimes lead to the death of the patient.

Intoxications in children, by its social-economic implications, represent at present a major problem of Public Health and Bioethics. The published statistical studies suggest that in Europe, acute intoxications represent the main cause of emergency admission in the developed countries; in developing countries, they represent the main cause of death in children and adolescents. In 2004, World Report assessed that worldwide 7% of the total number of accidental deaths are caused by intoxications. Acute intoxications in children and adolescents place at equal extent medical, social-economical and bioethical problems for doctors. The increasing prevalence of intoxications from an early age represents a warning signal with regard to this problem, which cannot be solved exclusively by medical means.

Key words: medical toxicology, intoxication in children, autonomy

Corresponding author: Alina Costina Luca - aclua@yahoo.com

*“Gr. T. Popa” University of Medicine and Pharmacy, Iași, Romania
Toxicology, which originates from the Greek (toxicon = poison for arrows) is a branch of Biology which studies the side effects caused by different chemical substances or physical agents on living organisms. These side effects can have different forms, causing slight changes in the organism or even unexpected death [1, 2].

During the Renaissance period, Paracelsus (1493-1541), a famous alchimist, stated the following: “All substances are poisonous, there is no substance that is not poisonous; the toxicity of a substance is only given by the size of its dosis” [1,3]

Even though this science appeared early in the Antiquity, the 20th and 21st centuries registered multiple progresses of medical toxicity. This period was marked by the appearance of the large pharmaceutical companies which develop research studies and create, on a permanent basis, new drugs, some of them having toxicities and interactions which cannot be fully known and anticipated. [2, 4]

The increase in frequency of intoxications in children in recent decades is in direct relation to the industrialization degree, technical progresses and the increase of life standards. Therefore, intoxications were included among the civilization specific diseases, having important medical and social consequences, requiring expensive and long-term care and producing much human suffering which can sometimes, lead to the death of the patient.

Acute intoxications in children are medical emergencies the evolution of which depends on the fast and correct implementation of first aid gestures. In this respect, the society should give a great importance to the sanitary education of the population for the purpose of recognizing the way intoxications occur in children, the clinical manifestations and the first aid gestures.

Intoxications in children, by their social-economic implications, represent at present a major problem of Public Health and Bioethics. The published statistical studies suggest that in Europe, acute intoxications represent the main cause of emergency hospitalization in the developed countries and the main cause of death in children and adolescents in developing countries. In 2004, World Report assessed that at world level 7% of the total number of accidental deaths are caused by by intoxications. [5,6]

While in the 1-5-year old children the most frequent intoxications are accidental, as a consequence of the tendency of the child not monitored by the parents “to explore” and use different substances or drugs, in adolescents intoxications are in most cases voluntary for suicidal purposes. [6,7]

With regard to the nature of the incriminated toxins in decreasing order, they are: drugs (involved in 50% of the cases) – paracetamol, aspirin, algocalmin, ibuprofen, sedatives, anti-depressives, barbiturates, antihistaminic; domestic substances – corrosive substances (caustic soda), acids, insecticides, pesticides, raticides, petrol, disinfecting solutions, cleansers, cosmetic products (perfume, aftershave, hair dye tincture, nail polish, deodorant); other toxic substances (15%) such as: alcohol, fungi, carbon monoxide, but also the intoxications with poisoning plants,
marine toxic plants, snake-bite or insect sting (bee, wasp or spider). [5,6,7]

Dealing with a patient with pediatric age and in most cases with an altered mental status to whom the physician cannot perform a correct anamnesis of the ingurgitated toxic substance and of its quantity, the practitioner can rely only on a correct clinical examination and a toxicological screening in order to establish the positive diagnostic and the therapeutic behavior.

The anamnesis must contain: the age, body weight, exact time of the ingurgitation, ingurgitated toxic substance, quantity, social environment of the patient (alcohol, drug consumers, smokers), previous pathologic and hereditary-collateral history.

The clinical examination must assess: vital signs, mental status, pupils, teguments, mucous membranes, cardiovascular apparatus, pulmonary and gastrointestinal status and the central nervous system.

A particular case is represented by alcohol intoxication. Alcohol is a sedative – hypnotic, non-pharmaceutical, which determines in children the depression of the central nervous system, even in small doses. Alcohol has a synergic effect with sedatives, being able to determine respiratory distress and even the death of the patient.

The bioethical aspects under discussion are connected to the voluntary ingestion in adolescents for suicidal purposes or as a retaliation after family disputes. In these cases, one shall ask for the help of a psychologist and/or a neuro-psychiatrist in order to assess the mental status of the patient, for the purpose of preventing certain eventual relapses. In most cases, the anamnesis shows the presence of an interfamilial or social abuse and in this case the attending physician has the obligation to notify the competent authorities and eventually the forensic medical service, when needed.

The consequences of alcohol consumption are represented by the antisocial behavior: violence, criminality, suicidal tendency, the increase of morbidity and mortality by car accidents, transmission of STD including HIV, malformations of the fetus of the mother who consumes alcohol, with hepatic cirrhosis and other hepatic disorders [8, 9]. With regard to the long-term impact of alcohol consumption against health, it is represented by: coronary disease, intoxication, cancer and immune-suppression. The World Health Organization (WHO) highlights the immunosuppressive effects of alcohol, in this case increasing the risk of transmission of certain disorders including tuberculosis. The International Agency for Research on Cancer highlighted that alcohol is a carcinogen factor, therefore increasing the risk of cancer at the level of the oral cavity, pharynx, esophagus, breasts and colon in direct relation to the amount of the ingurgitated alcohol.

In USA, the studies carried out by the National Highway Traffic Safety Administration (NHTSA) showed in 2004 that 13.6% of the drivers involved in fatal accidents were young persons, aged between 15 and 20. For the same year and age group, 29% of the car drivers who died in car accidents were under the influence of alcoholic drinks. [10, 11]

Alcohol addiction is USA reaches
its peak with youngsters between 18 and 20 years of age, namely before they have the legal age to drink alcohol. The percentage of students in the 8th, 10th and 12th grades who consume alcohol, marijuana or who smoke is increasing in USA at alarming levels. [6, 7, 12,]

In Romania, the number of adolescents who consume alcohol increases with age. Alcohol is the main cause of deaths by car accidents, homicides or suicides at this age. In the Toxicology Ward of Clinic I Pediatrics of Child Care Hospital in Iaşi, alcoholic comas in children and adolescents (of both sexes) are frequent. [6]

Another intoxication with consequences of vital importance for the child and adolescent is the tabacosis [13].

Tabacosis is a chronic and acute intoxication with toxic substances present in tobacco leaves, after an excessive and long-term use. The harmful action of tobacco, often called the weed of the devil or death weed, is exercised by the 4,000 chemical substances existing in the leaves, of which 480 are toxic, and more than 30 components are carcinogenic. [14]

The main toxic components of the cigarette smoke are: nicotine, tar, carbon monoxide, benzopyrene, different alkaloids, cresols, pyridines and radioactive elements (cadmium, polonium). Nicotine is involved in the determination of cardiovascular diseases, with direct action on blood vessels and on the nervous cells of the brain; it increases blood pressure and blood cholesterol level, causing the risk of cerebral congestion and vascular thromboses. Tabacosis is at the origin of several diseases such as the cardiovascular diseases (pectoral angina, myocardial infarct, blood pressure increase, obliterated arthritis and thromboses), chronic and acute pulmonary diseases, bronchitis, smoker’s cough, pneumonia, pulmonary sclerosis, pulmonary emphysema, tuberculosis, cancers with different localizations (lungs, larynx, esophagus, lips, tongue, pancreas, liver, stomach, colon, prostate), gastro-intestinal diseases (gastritis, gastric and duodenal ulcer, halitosis), weakening of reflexes in car drivers, contributing to the increase of the risk of accidents, weakening sexual potency. [7,15]

It would be worth analysing the influence that cigarette burning has on the composition of tobacco smoke. Therefore, a more rapid smoking would cause a more toxic smoke as the cigarette overheats due to the high amount of air.

International Congress on Nicotine held in 1964 in Stockholm and New York Conference in 1967 are the main international medical events where tobacco was defined as “the main public menace” to humans. Nowadays, tabacosis is regarded as a malady having the characteristics of a pandemy of this century. [16]

It has been estimated that the annual net losses due to the use of tobacco is 200 billion dollars, each thousand tones of tobacco that is being used causing the death of 650 persons.

Non-smokers exposed to a smoking environment (passive smokers) also present a high risk of developing smoking-associated diseases [3]. Each year, almost 33,000 passive smokers in USA and 20,000 in the EU die from this cause. In passive smokers, the risk of cardiovascular diseases increases by 60%. According to WHO statistics, the number of smokers at world level in
Table 1 Number of smokers worldwide assessed by WHO in 2005

<table>
<thead>
<tr>
<th>Number of smokers worldwide assessed by WHO in 2005</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
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<tr>
<td>Developed countries</td>
<td>200 million</td>
<td>100 million</td>
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<tr>
<td>Developing countries</td>
<td>700 million</td>
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In Romania, in 2004, 17,000 hectares were cultivated with tobacco. Smoking is part of the daily existence, being, unfortunately, an expression of „the modern life style”. The average number of cigarettes consumed every day by a smoker worldwide is 15 (it varies from 10 in Africa to 18 in Europe and America). WHO data regarding the extension of the smoking habit among the 15-year young people in certain countries in Europe is the proof of the increase of tobacco use both by boys and girls. [6]

Romanian smokers represent more than 30% of the active population, which places us among the top 10 countries in Europe, according to the number of smokers. Half of the Romanian started smoking before turning 20 years old and other 33% at 20-25 year old.

The highest risk of the addiction and intoxication with tobacco is registered in children and adolescents. First of all, for psychological reasons, young people embrace easily smoking, that they associate with maturity, independence, virility and modernism, without knowing the major risks of a serious morbidity after the installation of nicotine addiction. This addiction installs surprisingly fast, only a few days after smoking. This aspect is explained by the fact that the brain of the young people is more vulnerable to the smoker’s intoxication as compared to the adult brain. It would be worth mentioning that tobacco addiction is faster for girls than boys.

Another phenomenon with major medical, social and ethical implications is drug addiction. The increase of the degree of drug use by adolescents is a problem at national, European and world level.

From a pharmacological point of view, the word drug defines “any chemical substance used in the curative or preventive treatment or in the diagnosis of a disease or for increasing the physical and/or mental comfort [3,17]

The World Health Organization WHO defined the addiction as a periodic or chronic intoxication caused by the repeated use of a natural or synthetic drug [2, 4].

At present, there are almost 190 million drug users worldwide, most of them being adolescents and young persons under 30 years old, the profile industry having an estimative turnover of 400 billion dollars per year. [2,17]. Moreover, the number of cannabis consumers increased to almost 160 million (4% of the population aged between 15 and 64), the number of opioid consumers (16 million persons, of which 11 million abused of heroin) and the number of cocaine consumers, reaching the value of almost 14 million persons.[4,17]

United Nations Office on Drugs and Crime confirms that the market value of illicit drugs in 2003 is 13 bilion dollars in terms of production and 94 billion dollar for gross sales,
also considering the quantities that have been seized, and 322 billion dollars for retail sales according to the prices on the market and the quantities that have been confiscated. The income obtained in the drug industry is higher than the gross domestic product of 88% of all countries in the world.

The National Household Survey on Drug Abuse (NHSDA) assessed that in USA, of the 23 million young people aged between 12 and 17, more than 2 million used inhalants during their lives. In the category of the inhaled substances, the most frequent were: glue, shoe polish or toluene (4%), gasoline and lighter gas (3%), sprayable paints, inhalation of dish soap or sprays (2%) [19, 20].

The above data caused concern to the European Union. Therefore, the European Monitoring Centre for Drugs and Drug Addiction was established, initiating a project aiming at monitoring the young persons, called The European School Survey Project (ESPAD). The target group comprised young persons aged between 15 and 16 of the 25 member countries plus Norway and Croatia. The results of the study highlighted a direct connection between the tobacco consumption and cannabis consumption. Therefore, important increases of cannabis consumption were noticed each year until 2003, once with the initiation action coordinated at European level, for the purpose of reducing smoking, which determined a decrease of cannabis consumption. [21]

The assessments of the prevalence of the consumption of other drugs among students are smaller than those for cannabis consumption. For instance, the prevalence of cocaine use among students of 15 – 16 years old is between 1% and 2% in half of the countries included in the study, while Spain, France and Great Britain have a prevalence of 5%.

In Romania, the first survey took place in 2004. The poll showed reduced prevalence with regard to the consumption of illicit drugs. Only 1.7% of the persons aged between 15-64 years old reported cannabis consumption at least once in their lives. For other illicit drugs namely heroin, cocaine, amphetamine, ecstasy and LSD the prevalence degrees during the life were of 1% in Romania. In 2007 these numbers dropped to 1.5 for cannabis and below 0.5 for other drugs.

The preliminary data obtained based on certain tests performed among the consumers who asked for medical assistance in Bucharest suggest a very small prevalence for HIV – 0.01% (two positive cases of 182 tested cases). For the hepatic virus B (HVB), the prevalence of the infection rates among the consumers of injectable drugs in Bucharest, in 2008, is 11.7%. [6]

The damages that drug consumption causes to the organism of the child and adolescent are extremely important and affect both the somatic and the psychic plans. With regard to the psychological and neurological effects, there were modifications in perception, in intellectual performances of the individual, anxiety, psychoses, obsessions, depressions, hallucinations and decrease of memory. [15,18]

The respirator effects are rhinitis, pharyngitis, laryngitis, bronchial cough, symptoms similar in most cases to those reported by tobacco smokers. The observed cardiovascular effects are represented by fibrillation, tachycardia, arterial hypertension. In
addition, studies on animals reported a major increase of the number of spontaneous abortions and fetal malformations.

For the physician, the acute intoxications in children and adolescents place in equal measure medical, social-economic and bioethical problems. The continuously increasing prevalence of intoxications at ever earlier ages is a warning signal with regard to this problem, which cannot be solved exclusively by medical means. Family, school and society must cooperate with the physician, as a whole, in solving these sensitive problems of public healthcare. By their particular nature, given by the age of the patients (who are minor) and the social condition of most of them (often precarious) the pediatric intoxications represent a real problem of Bioethics. The physician has the professional competency given by the experience and the years of study, but he must also have solid communication knowledge, in order to interact positively with the patient and with his family. In the 21st century the patient must be regarded as a partner and at the same time as an active participant in the medical act, implicitly in the treatment of the respective condition.

On the one hand, the physician must observe the patient autonomy and treat him accordingly, which are in fact the two basic principles in Bioethics. On the other hand, the Pediatric physician must also have in view the laws of the Romanian state (Law no. 143/2000) – which forbid the consumption of alcohol, tobacco and drugs among minors and, if we refer to the latest intoxication, the production, sale and consumption are also illegal after the age of 18. From our practice, there are many cases where parents often refuse to believe that their children consumed drugs, alcohol or other harmful substances. Negation is eventually a refuge, in which parents consider on the one hand that they love their children (believing them 100%) and on the other hand they eliminate their own feeling of guiltiness. The Bioethical dilemma of the physician in this case is the extent in which he can get involved. Some voices say that the patient being minor and breaking the rules of the Romanian state, the physician is the main authority in solving the overall problem, the rights of the patient being at that particular moment suppressed in favor of any decision of the medical act. [22,23]

Other voices plead for judging this according to the peculiarities of each case. These ethical dilemmas of the pediatric physician must often be corroborated with the emergency of the medical act (the patient often reaches the hospital in a critical condition), which changes the limit, raising new questions and Bioethical problems for the attending physician. According to the principle of beneficence (doing good), the pediatric physician must limit strictly to the medical emergency or get actively involved, together with psychologists, neuro-psychiatrists and social workers for the purpose of elucidating the causes and the factors and remove them.

The patients who reach the hospital in critical condition are in most cases vulnerable on the one hand because of the abuse of substances (which determine mental, behavioral changes and personality disorders) and on the other hand they fear from the marginalization of the society in which we are living. Corroborated with more and more early ages – and therefore
with the lack of life experience – and the impossibility to make decisions, these experiences can generate serious problems in the future, creating therefore a vicious circle (the minor will repeat the alcohol consumption, etc.), finally reaching to addiction and subsequently to death.

Conclusions
The children with intoxications belong to the category of vulnerable subjects, due to the age which involves their incapacity of making decisions, imposing the intervention of the parents or of the tutors, but also that of the competent medical staff. This paper is a pleading for the necessity to integrate the ethical principles in the pediatric practice and mainly in the pediatric toxicology, aspects which ensure the placement of this science among the medical specialties which highlight the respect towards the child. The existence of the cohesion of a functional medical team (pediatric physician, psychologist, neuro-psychiatrist, etc.) is essential in order to obtain positive results.

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